RSC Advances, 2014, vol.4, N1, pages 488-494

Enhanced efficiency of antiseptics with sustained release from clay nanotubes

Wei W., Minullina R., Abdullayev E., Fakhrullin R., Mills D., Lvov Y.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Natural halloysite clay tubules were studied for their potential use as miniature biocompatible containers that can be loaded with antiseptics followed by their slow and controlled release. Brilliant green was loaded into 15 nm diameter halloysite lumen at 15 wt% and provided sustained release over six hours. Formation of a benzotriazole-copper coating on halloysite nanotubes allowed additional encapsulation providing for more sustained release from 50 to 200 hours. Antibacterial efficiency of the brilliant green in clay nanotubes was tested on Staphylococcus aureus cultures and antibacterial action extended up to 72 hours was demonstrated. Sustained release of amoxicillin and iodine from halloysite tubes was also demonstrated.

http://dx.doi.org/10.1039/c3ra45011b